WHAT IS CLAIMED IS

1. A method of forming a metal film from a metal carbonyl compound source, comprising the steps of:

(A) introducing a gaseous source material containing a metal carbonyl compound into a process space adjacent to a surface of a substrate to be processed in such a manner that said metal carbonyl compound has a first partial pressure;

(B) depositing a metal film on said surface of said substrate by introducing a gaseous source material containing said metal carbonyl compound into said process space in such a mater that said metal carbonyl compound has a second, smaller partial pressure,

said step (A) being conducted such that there is caused no substantial deposition of said metal film on said substrate.

2. A method as claimed in claim 1, wherein said step (A) is conducted by setting the temperature of a source vessel holding said metal carbonyl compound to a first temperature, and wherein said step (B) is conducted by setting the temperature of a source vessel holding said metal carbonyl compound to a second, lower temperature.

3. A method as claimed in claim 1, wherein said step (A) is conducted by setting a flow rate of a carrier gas to a first value when supplying said gaseous source material containing said metal carbonyl compound to said process space and wherein said step (B) is conducted by setting said flow rate of said carrier gas to a second, larger value.

4. A method as claimed in claim 1, wherein said step (A) is conducted by supplying said gaseous source material containing said metal carbonyl compound into said process space while setting a pressure of said process space to a first pressure, and wherein said step (B) is conducted by supplying said gaseous source material containing said metal carbonyl compound into said process space while setting a pressure of said process space to a second, lower pressure.

5. A method as claim 4, wherein said first pressure is about 70Pa or less.

6. A method as claimed in claim 4, wherein said second pressure is about 13Pa or less.

7. A method as claimed in claim 1, wherein said step (A) and said step (B) are conducted at a substrate temperature of less than 500℃.

8. A method as claimed in claim 1, wherein said step (A) and said step (B) are conducted at a substrate temperature of less than 400℃.

9. A method as claimed in claim 1, wherein a surface of said substrate is covered with an insulation film.

10. A method as claimed in claim 1, wherein said metal carbonyl compound is selected from the group consisting of $W(CO)_6$, $Co(CO)_6$, $Mo(CO)_6$ and $[Rh(CO)_4]_4$.

11. A method as claimed in claim 1, wherein said steps (A) and (B) are conducted continuously in a common processing vessel.